LISTING OF THE CLAIMS

1. (Currently Amended) An oil pump rotor assembly comprising:

an inner rotor having "n" external teeth ("n" is a natural number); ~~and~~

an outer rotor having (n+1) internal teeth which are engageable with the external teeth; and

the distance between an apex of an outer tooth of the inner rotor and an apex of an inner tooth of the outer rotor when the apexes oppose each other defining a tip clearance therebetween,

wherein the oil pump rotor assembly is used in an oil pump which further includes a casing having a suction port for drawing fluid and a discharge port for discharging fluid, and which conveys fluid by drawing and discharging fluid by volume change of cells formed between tooth surfaces of the inner rotor and the outer rotor during relative rotation between the inner rotor and the outer rotor engaging each other,

wherein each of the tooth profiles of the outer rotor is formed such that the tooth space profile thereof is formed using an epicycloid curve which is generated by rolling a circumscribed-rolling circle Ao along a base circle Do without slip, and the tooth tip profile thereof is formed using a hypocycloid curve which is generated by rolling an inscribed-rolling circle Bo along the base circle Do without slip,

wherein the tooth space profile of the inner rotor is formed based on a hypocycloid curve which is formed by rolling an inscribed-rolling circle Bi along a base circle Di without slip, ~~and~~

wherein the tooth tip profile of the inner rotor is formed such that an epicycloid curve, which is generated by rolling a circumscribed-rolling circle Ai along the base circle Di without slip,

is equally divided into two at a midpoint thereof to obtain two outer tooth curve segments, and the two outer tooth curve segments are separated by a predetermined distance and are smoothly connected to each other using a curve or a straight line, and

wherein the predetermined distance between the two outer tooth curve segments is designated by "α", and the tip clearance is designated by "t", "α" is set so as to satisfy the following inequalities:

$t/4 \leq \alpha \leq 3t/4$.

2. (Original) An oil pump rotor assembly according to claim 1, wherein the separation of the two outer tooth curve segments is performed in such a manner that the two outer tooth curve segments are moved along the circumference of the base circle Di.

3. (Withdrawn) An oil pump rotor assembly according to claim 1, wherein the separation of the two outer tooth curve segments is performed in such a manner that the two outer tooth curve segments are moved in the direction of a tangent of the epicycloid curve drawn at the midpoint thereof.

4. (Withdrawn) An oil pump rotor assembly according to claim 1, wherein the separation of the two outer tooth curve segments is performed in such a manner that the two outer tooth curve segments are first moved along the circumference of the base circle Di, and then moved in the direction of a tangent of the epicycloid curve drawn at the midpoint thereof.

5. (Withdrawn)   An oil pump rotor assembly according to claim 1, wherein the separation of the two outer tooth curve segments is performed in such a manner that the two outer tooth curve segments are first moved in the direction of a tangent of the epicycloid curve drawn at the midpoint thereof, and then moved along the circumference of the base circle Di.

6. (Canceled)

7. (Withdrawn)   An oil pump rotor assembly according to claim 6, wherein the predetermined distance "α" is set so as to satisfy the following inequalities:

$2t/5 \leq \alpha \leq 3t/5$.

8. (Currently Amended)   An oil pump rotor assembly comprising:

an inner rotor having "n" external teeth ("n" is a natural number); ~~and~~

an outer rotor having (n+1) internal teeth which are engageable with the external teeth; and

the distance between an apex of an outer tooth of the inner rotor and an apex of an inner tooth of the outer rotor when the apexes oppose each other defining a tip clearance therebetween,

wherein the oil pump rotor assembly is used in an oil pump which further includes a casing having a suction port for drawing fluid and a discharge port for discharging fluid, and which conveys fluid by drawing and discharging fluid by volume change of cells formed between tooth surfaces of the inner rotor and the outer rotor during relative rotation between the inner rotor and the outer rotor engaging each other,

wherein each of the tooth profiles of the inner rotor is formed such that the tooth tip profile thereof is formed using an epicycloid curve which is generated by rolling a circumscribed-rolling circle Ai along a base circle Di without slip, and the tooth space profile thereof is formed using a hypocycloid curve which is generated by rolling an inscribed-rolling circle Bi along the base circle Di without slip,

wherein the tooth space profile of the outer rotor is formed based on an epicycloid curve which is formed by rolling a circumscribed-rolling circle Ao along a base circle Do without slip, ~~and~~

wherein the tooth tip profile of the outer rotor is formed such that a hypocycloid curve, which is generated by rolling an inscribed-rolling circle Bo along the base circle Do without slip, is equally divided into two at a midpoint thereof to obtain two inner tooth curve segments, and the two inner tooth curve segments are separated by a predetermined distance and are smoothly connected to each other using a curve or a straight line, and

wherein the predetermined distance between the two inner tooth curve segments is designated by "β", and the tip clearance is designated by "t", "β" is set so as to satisfy the following inequalities:

$t/4 \leq \beta \leq 3t/4$.

9. (Original) An oil pump rotor assembly according to claim 8, wherein the separation of the two inner tooth curve segments is performed in such a manner that the two inner tooth curve segments are moved along the circumference of the base circle Do.

10. (Withdrawn) An oil pump rotor assembly according to claim 8, wherein the separation of the two inner tooth curve segments is performed in such a manner that the two inner tooth curve segments are moved in the direction of a tangent of the hypocycloid curve drawn at the midpoint thereof.

11. (Withdrawn) An oil pump rotor assembly according to claim 8, wherein the separation of the two inner tooth curve segments is performed in such a manner that the two inner tooth curve segments are first moved along the circumference of the base circle Do, and then moved in the direction of a tangent of the hypocycloid curve drawn at the midpoint thereof.

12. (Withdrawn) An oil pump rotor assembly according to claim 8, wherein the separation of the two inner tooth curve segments is performed in such a manner that the two inner tooth curve segments are first moved in the direction of a tangent of the hypocycloid curve drawn at the midpoint thereof, and then moved along the circumference of the base circle Do.

13. (Canceled)

14. (Withdrawn) An oil pump rotor assembly according to claim 13, wherein the predetermined distance "β" is set so as to satisfy the following inequalities:

$2t/5 \leq \beta \leq 3t/5$.

15. (Currently Amended)   An oil pump rotor assembly comprising:

an inner rotor having "n" external teeth ("n" is a natural number); ~~and~~

an outer rotor having (n+1) internal teeth which are engageable with the external teeth;

and

the distance between an apex of an outer tooth of the inner rotor and an apex of an inner tooth of the outer rotor when the apexes oppose each other defining a tip clearance therebetween,

wherein the oil pump rotor assembly is used in an oil pump which further includes a casing having a suction port for drawing fluid and a discharge port for discharging fluid, and which conveys fluid by drawing and discharging fluid by volume change of cells formed between tooth profiles of the inner rotor and the outer rotor during relative rotation between the inner rotor and the outer rotor engaging each other,

wherein the tooth tip profile of the inner rotor is formed such that an epicycloid curve, which is generated by rolling a circumscribed-rolling circle A_i along a base circle D_i without slip, is equally divided into two at a midpoint thereof to obtain two outer tooth curve segments, and the two outer tooth curve segments are separated by a predetermined distance and are smoothly connected to each other using a curve or a straight line,

wherein the tooth space profile of the inner rotor is formed based on a hypocycloid curve which is formed by rolling an inscribed-rolling circle B_i along the base circle D_i without slip,

wherein the tooth space profile of the outer rotor is formed based on an epicycloid curve which is formed by rolling a circumscribed-rolling circle A_o along a base circle D_o without slip,

~~and~~

wherein the tooth tip profile of the outer rotor is formed such that a hypocycloid curve, which is generated by rolling an inscribed-rolling circle B_o along the base circle D_o without slip, is

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equally divided into two at a midpoint thereof to obtain two inner tooth curve segments, and the inner tooth curve segments are separated by a predetermined distance and are smoothly connected to each other using a curve or a straight line, and

wherein the predetermined distance between the two outer tooth curve segments i designated by "α", the predetermined distance between the two inner tooth curve segments is designated by "β", and the tip clearance is designated by "t", "α" and "β" are set so as to satisfy the following inequalities:

$t/4 \leq \alpha \leq 3t/4$; and

$t/4 \leq \beta \leq 3t/4$.

16. (Original)   An oil pump rotor assembly according to claim 15, wherein the separation of the two outer tooth curve segments is performed in such a manner that the two outer tooth curve segments are moved along the circumference of the base circle Di, and the separation of the two inner tooth curve segments is performed in such a manner that the two inner tooth curve segments are moved along the circumference of the base circle Do.

17. (Withdrawn) An oil pump rotor assembly according to claim 15, wherein the separation of the two outer tooth curve segments is performed in such a manner that the two outer tooth curve segments are moved in the direction of a tangent of the epicycloid curve drawn at the midpoint thereof, the separation of the two inner tooth curve segments is performed in such a manner that the two inner tooth curve segments are moved in the direction of a tangent of the hypocycloid curve drawn at the midpoint thereof.

18. (Withdrawn) An oil pump rotor assembly according to claim 15, wherein the separation of the two outer tooth curve segments is performed in such a manner that the two outer tooth curve segments are first moved along the circumference of the base circle Di, and then moved in the direction of a tangent of the epicycloid curve drawn at the midpoint thereof, and the separation of the two inner tooth curve segments is performed in such a manner that the two inner tooth curve segments are first moved along the circumference of the base circle Do, and then moved in the direction of a tangent of the hypocycloid curve drawn at the midpoint thereof.

19. (Withdrawn) An oil pump rotor assembly according to claim 15, wherein the separation of the two outer tooth curve segments is performed in such a manner that the two outer tooth curve segments are first moved in the direction of a tangent of the epicycloid curve drawn at the midpoint thereof, and then moved along the circumference of the base circle Di, and the separation of the two inner tooth curve segments is performed in such a manner that the two inner tooth curve segments are first moved in the direction of a tangent of the hypocycloid curve drawn at the midpoint thereof, and then moved along the circumference of the base circle Do.

20. (Canceled)

21. (Withdrawn) An oil pump rotor assembly according to claim 20, wherein the predetermined distance "α" and the predetermined distance "β" are set so as to satisfy the following inequalities:

$2t/5 \leq \alpha \leq 3t/5$; and

$2t/5 \leq \beta \leq 3t/5$.

22. (Previously presented) An oil pump rotor assembly according to claim 1, wherein the inner rotor and the outer rotor are formed such that the following equations are satisfied:

øAi+t/2=øAo;

øBi-t/2=øBo;

øAi+øBi=øAo+øBo=2e;

øDi=n·(øAi+øBi);

øDo=(n+1)·(øAo+øBo); and

(n+1)·øDi=n·øDo,

where, øDi is the diameter of the base circle Di of the inner rotor, øAi is the diameter of the circumscribed-rolling circle Ai, øBi is the diameter of the inscribed-rolling circle Bi, øDo is the diameter of the base circle Do of the outer rotor, øAo is the diameter of the circumscribed -rolling circle Ao, øBo is the diameter of the inscribed-rolling circle Bo, "e" is an eccentric distance between the inner rotor and the outer rotor, and "t" is a tip clearance.

23. (Previously presented) An oil pump rotor assembly according to claim 1, wherein the inner rotor and the outer rotor are formed such that the following equations are satisfied:

øAi+t/(n+2)=øAo;

øBi=øBo;

øAi+øBi=2e;

$\text{ø}Di = n \cdot (\text{ø}Ai + \text{ø}Bi)$; and

$\text{ø}Do = \text{ø}Di \cdot (n+1)/n + t \cdot (n+1)/(n+2)$,

where, øDi is the diameter of the base circle Di of the inner rotor, øAi is the diameter of the circumscribed-rolling circle Ai, øBi is the diameter of the inscribed-rolling circle Bi, øDo is the diameter of the base circle Do of the outer rotor, øAo is the diameter of the circumscribed-rolling circle Ao, øBo is the diameter of the inscribed-rolling circle Bo, "e" is an eccentric distance between the inner rotor and the outer rotor, and "t" is a tip clearance.

24. (Previously presented) An oil pump rotor assembly according to claim 1, wherein the inner rotor and the outer rotor are formed such that the following equations are satisfied:

$\text{ø}Ai = \text{ø}Ao$;

$\text{ø}Bi + t/(n+2) = \text{ø}Bo$;

$\text{ø}Ai + \text{ø}Bi = 2e$;

$\text{ø}Di = n \cdot (\text{ø}Ai + \text{ø}Bi)$; and

$\text{ø}Do = \text{ø}Di \cdot (n+1)/n + t \cdot (n+1)/(n+2)$,

where, øDi is the diameter of the base circle Di of the inner rotor, øAi is the diameter of the circumscribed-rolling circle Ai, øBi is the diameter of the inscribed-rolling circle Bi, øDo is the diameter of the base circle Do of the outer rotor, øAo is the diameter of the circumscribed-rolling circle Ao, øBo is the diameter of the inscribed-rolling circle Bo, "e" is an eccentric distance between the inner rotor and the outer rotor, and "t" is a tip clearance.

25. (Previously presented) An oil pump rotor assembly according to claim 8, wherein the inner rotor and the outer rotor are formed such that the following equations are satisfied:

$\varnothing Ai + t/2 = \varnothing Ao$;

$\varnothing Bi - t/2 = \varnothing Bo$;

$\varnothing Ai + \varnothing Bi = \varnothing Ao + \varnothing Bo = 2e$;

$\varnothing Di = n \cdot (\varnothing Ai + \varnothing Bi)$;

$\varnothing Do = (n+1) \cdot (\varnothing Ao + \varnothing Bo)$; and

$(n+1) \cdot \varnothing Di = n \cdot \varnothing Do$,

where, $\varnothing Di$ is the diameter of the base circle Di of the inner rotor, $\varnothing Ai$ is the diameter of the circumscribed-rolling circle Ai, $\varnothing Bi$ is the diameter of the inscribed-rolling circle Bi, $\varnothing Do$ is the diameter of the base circle Do of the outer rotor, $\varnothing Ao$ is the diameter of the circumscribed-rolling circle Ao, $\varnothing Bo$ is the diameter of the inscribed-rolling circle Bo, "e" is an eccentric distance between the inner rotor and the outer rotor, and "t" is a tip clearance.

26. (Previously presented) An oil pump rotor assembly according to claim 15, wherein the inner rotor and the outer rotor are formed such that the following equations are satisfied:

$\varnothing Ai + t/2 = \varnothing Ao$;

$\varnothing Bi - t/2 = \varnothing Bo$;

$\varnothing Ai + \varnothing Bi = \varnothing Ao + \varnothing Bo = 2e$;

$\varnothing Di = n \cdot (\varnothing Ai + \varnothing Bi)$;

$\varnothing Do = (n+1) \cdot (\varnothing Ao + \varnothing Bo)$; and

$(n+1) \cdot \varnothing Di = n \cdot \varnothing Do$,

where, øDi is the diameter of the base circle Di of the inner rotor, øAi is the diameter of the circumscribed-rolling circle Ai, øBi is the diameter of the inscribed-rolling circle Bi, øDo is the diameter of the base circle Do of the outer rotor, øAo is the diameter of the circumscribed-rolling circle Ao, øBo is the diameter of the ins cribed-rolling circle Bo, "e" is an eccentric distance between the inner rotor and the outer rotor, and "t" is a tip clearance.

27. (Previously presented) An oil pump rotor assembly according to claim 8, wherein the inner rotor and the outer rotor are formed such that the following equations are satisfied:

øAi+t/(n+2)=øAo;

øBi=øBo;

øAi+øBi=2e;

øDi=n·(øAi+øBi); and

øDo=øDi·(n+1)/n+t·(n+1)/(n+2),

where, øDi is the diameter of the base circle Di of the inner rotor, øAi is the diameter of the circumscribed-rolling circle Ai, øBi is the diameter of the inscribed-rolling circle Bi, øDo is the diameter of the base circle Do of the outer rotor, øAo is the diameter of the circumscribed-rolling circle Ao, øBo is the diameter of the inscribed-rolling circle Bo, "e" is an eccentric distance between the inner rotor and the outer rotor, and "t" is a tip clearance.

28. (Previously presented) An oil pump rotor assembly according to claim 15, wherein the inner rotor and the outer rotor are formed such that the following equations are satisfied:

øAi+t/(n+2)=øAo;

$\varnothing Bi=\varnothing Bo$;

$\varnothing Ai+\varnothing Bi=2e$;

$\varnothing Di=n\cdot(\varnothing Ai+\varnothing Bi)$; and

$\varnothing Do=\varnothing Di\cdot(n+1)/n+t\cdot(n+1)/(n+2)$,

where, $\varnothing Di$ is the diameter of the base circle Di of the inner rotor, $\varnothing Ai$ is the diameter of the circumscribed-rolling circle Ai, $\varnothing Bi$ is the diameter of the inscribed-rolling circle Bi, $\varnothing Do$ is the diameter of the base circle Do of the outer rotor, $\varnothing Ao$ is the diameter of the circumscribed-rolling circle Ao, $\varnothing Bo$ is the diameter of the inscribed-rolling circle Bo, "e" is an eccentric distance between the inner rotor and the outer rotor, and "t" is a tip clearance.

29. (Previously presented) An oil pump rotor assembly according to claim 8, wherein the inner rotor and the outer rotor are formed such that the following equations are satisfied:

$\varnothing Ai=\varnothing Ao$;

$\varnothing Bi+t/(n+2)=\varnothing Bo$;

$\varnothing Ai+\varnothing Bi=2e$;

$\varnothing Di=n\cdot(\varnothing Ai+\varnothing Bi)$; and

$\varnothing Do=\varnothing Di\cdot(n+1)/n+t\cdot(n+1)/(n+2)$,

where, $\varnothing Di$ is the diameter of the base circle Di of the inner rotor, $\varnothing Ai$ is the diameter of the circumscribed-rolling circle Ai, $\varnothing Bi$ is the diameter of the inscribed-rolling circle Bi, $\varnothing Do$ is the diameter of the base circle Do of the outer rotor, $\varnothing Ao$ is the diameter of the circumscribed-rolling circle Ao, $\varnothing Bo$ is the diameter of the inscribed-rolling circle Bo, "e" is an eccentric distance between the inner rotor and the outer rotor, and "t" is a tip clearance.

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30. (Previously presented) An oil pump rotor assembly according to claim 15, wherein the inner rotor and the outer rotor are formed such that the following equations are satisfied:

$\text{\o}Ai = \text{\o}Ao;$

$\text{\o}Bi + t/(n+2) = \text{\o}Bo;$

$\text{\o}Ai + \text{\o}Bi = 2e;$

$\text{\o}Di = n \cdot (\text{\o}Ai + \text{\o}Bi);$ and

$\text{\o}Do = \text{\o}Di \cdot (n+1)/n + t \cdot (n+1)/(n+2),$

where, $\text{\o}Di$ is the diameter of the base circle Di of the inner rotor, $\text{\o}Ai$ is the diameter of the circumscribed-rolling circle Ai, $\text{\o}Bi$ is the diameter of the inscribed-rolling circle Bi, $\text{\o}Do$ is the diameter of the base circle Do of the outer rotor, $\text{\o}Ao$ is the diameter of the circumscribed-rolling circle Ao, $\text{\o}Bo$ is the diameter of the inscribed-rolling circle Bo, "e" is an eccentric distance between the inner rotor and the outer rotor, and "t" is a tip clearance.